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PCT/KR2003/001494

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Artcle 36 and Rule 70)

Applicant's or agent's file reference 2003OPA2765	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. **PCT/KR2003/001494**	International filing date *(day/month/year)* **25 JULY 2003 (25.07.2003)**	Priority date *(day/month/year)*

International Patent Classification (IPC) or national classification and IPC

IPC7 C07C 29/00

Applicant

POSTECH Foundation et al

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demamd	Date of completion of this report
25 FEBRUARY 2005 (25.02.2005)	23 SEPTEMBER 2005 (23.09.2005)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer MOON, Sun Heup Telephone No. 82-42-481-5543

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/KR2003/001494

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☒ the description:
pages 1-22 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

☒ the claims:
pages 23 - 31 , as originally filed
pages NONE , as amended (together with any statment) under Article 19
pages NONE , filed with the demand
pages NONE , filed with the letter of _____

☐ the drawings:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

☐ the sequence listing part of the description:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language English which is

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☒ the language of publication of the international application(under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide** and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained inthe international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disc losure in the international applicationas as filed has been furinshed.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box(Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.
PCT/KR2003/001494

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1 - 21	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1 - 21	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1 - 21	YES
	Claims	NONE	NO

2. Citations and explanations (Rule 70.7)

1. Reference is made to the following documents:
D1: KR 2001-0040121
D2: Organometallics(1999,v.18, PP.3981-3990)

2. Novelty and Inventive Step

The present invention relates to a method for preparing (S)-chiral alcohol with high yield and high optical purity by mixing achiral substrates such as racemic alcohol or ketone with metal catalyst and protein hydrolase to perform a dynamic kinetic resolution reaction.

Document D1, which is considered to represent the most relevant state of the art, discloses a process for preparing a chiral ester by reacting a)racemic alcohol, b)a ruthenium complex catalyst, c)a lipase to acylate selectively one of enantiomers of said racemice alcohol, and d)an acyl donor group to supply acyl group to said lipase.

Docment D2 discloses the racemization of α-hydroxy ester using Pseudomonas cepacia lipase, ruthenium catalyst, and 4-chlorophenyl acetate as acyl donor in cyclohexane.

Although D1-D2 relate to methods for preparing optically active alcohol using enzyme catalyst, metal catalyst, and acyl donor like the present invention, they are different from the present invention in that since lipase is used as enzyme catalyst in the prior art documents, only R-entiaomer(that is, R-chiral alcohol) can be synthesized, whereas the present invention can provide a method of synthesizing (S)-chiral alcohol enantioselectively with high purity and high yield.

Moreover, a protein hydrolysis enzyme in the present invention, which plays a useful role in stimulating the enantioselective acylation of a racemic compound, is used as opposite stereoselectivity to lipase in D1-D2. Consequently, the present invention provides a novel process for preparing the (S)-chiral alcohol which is not easily exchangeable by the those who are skilled in the art and suggests a synthesis method of (S)-chiral alcohols with high optical purity and high yield.

Therfore, the subject matter of claims 1-21 of the present invention is considered to be novel and to involve an inventive step in the sense of PCT Article 33(2) and (3).

3. Industrial applicability

The subject matter of the claim 1-21 is considered to be industrially applicable under PCT Article 33(4).